

## CLAIMS

### What is claimed is:

1. A S-type wave-guide adjustable optical attenuator, comprising:  
  
a cladding layer, having a first refraction index and forming a slot therein; and  
  
5 a core layer, embedded in the slot of the cladding layer and having a second refraction index sensitive to temperature change, wherein the attenuation of an optical signal transmitted through the core layer varies according to the temperature of the core layer.
2. The optical attenuator of claim 1, wherein the core layer is made of a polymer  
10 material.
3. The optical attenuator of claim 1, wherein the cladding layer is made of a glass material.
4. The optical attenuator of claim 1, wherein an upper surface of the core layer further includes an electrode layer thereon.
- 15 5. The optical attenuator of claim 4, further comprising a buffer layer between the electrode layer and the core layer.
6. The optical attenuator of claim 5, wherein the buffer layer is made of silicon dioxide.
7. The optical attenuator of claim 1, further comprising a temperature controller  
20 operable to vary the temperature of the core layer.
8. The optical attenuator of claim 7, wherein the temperature controller further comprises a heater operable to vary the temperature of the core layer.
9. The optical attenuator of claim 7, wherein the temperature controller further comprises a cooling device operable to vary the temperature of the core layer.
- 25 10. An optical attenuating method using an S-type wave-guide, comprising:

transmitting an optical signal through an optical attenuator, wherein the optical attenuator includes a cladding layer and a core layer made of a polymer material and embedded in a slot of the cladding layer, the core layer having a temperature-sensitive refraction index; and

- 5       controlling the temperature of the core layer to attenuate the intensity of the optical signal.